

## **Memories for traumatic events: accuracy, types and characteristics**

Antonio L. Manzanero

Universidad Complutense de Madrid (Spain)

María Recio

Fundación Carmen Pardo-Valcarce (Spain)

### **Abstract**

The study of traumatic memories has generated considerable debate in recent decades due to their involvement in understanding the functioning of memory, its role in the assessment of clinical symptoms and because of the importance of traumatic memories in forensic settings. The aim of this study is to understand the causes that may help explain the controversy surrounding the traumatic memories. To do this the concept of trauma, the factors that can determine the memory and the accuracy of memories for trauma were analyzed. The revision leads us to the conclusion that there is a great variability when remembering a traumatic event. The difference depends on factors associated with trauma, and the characteristics of the person and context.

**Key words:** Autobiographical memory; trauma; emotion; post-traumatic stress disorder.

## **Introduction**

Memories for Trauma are defined as memories of events with negative valence and high emotional impact.

A recent review [1] proposed that the controversy regarding the traumatic memories can be summarized in several key points: a) whether these memories are different from other types of autobiographical memories, b) if traumatic memories are more or less accurate than memories of nontraumatic events, and c) whether these memories can be completely forgotten and remembered long after.

The impact of traumatic events have on people depends on different factors. But in any case, there are important individual differences that determine the phenomenological experience associated with the memory of the event experienced. In some cases, these events can lead to a *post-traumatic stress disorder*. This disorder is characterized by a tendency to re-experiencing (flashbacks, dreams or feeling reoccurring), avoidance (efforts to avoid thoughts, feelings, memories, places or people associated with the event) and hyperactivation (insomnia, irritability or outbursts of anger).

In the long term effects depend on the intensity of the trauma and vulnerability of the subject. Thus, trauma resulting from a traffic accident will not affect the victim in the same way that a trauma of an experience of continuous sexual abuse in childhood. For this reason, three key factors in response to a traumatic experience have been proposed: a) the negligent attachment experiences or other trauma in childhood, b) coping strategies, and c) social support to victims of trauma [2,3,4].

## **The debate about the differential features of memories for trauma**

Several proposals on the differential features of traumatic memories can be distinguished: a) the proposals indicate that traumatic memories would differ from other autobiographical memories, and b) those who claim that both types of memories are similar. Then both proposals, and the main published research supporting these, will be developed.

### *The specificity of memories for trauma*

Several studies show that traumatic memories have different characteristics than other reports on autobiographical events. In this framework, two different proposals have been identified: a) the memories of traumatic events are *better* than neutral memories and b) the memories of traumatic events are *worse* than neutral memories.

Regarding the first proposal, different studies have highlighted the apparent superiority of the reports on traumatic events [5,6,7,8,9]. According to these studies, victims of traumatic events feel they are able to recall these events as if they occur, pretending to be immune to deterioration caused by time delay. This type of memory has been called *flashbulb memories*. An event of this kind is, for example, the attack in New York on September 11, 2001, whose emotional impact leaves no doubt. When we remember that day and what we did before, during and after the attack is very likely we have the feeling that these facts have been deeply recorded in our memory, we remember what happened in a very vivid and in great detail.

In this direction, some research [10] have shown that traumatic events are remembered better than non-traumatic events, three months later. Peace, Porter & Brinke [11] found, by comparing actual memories for sexual assault and for

nontraumatic events, that the former were more vivid, detailed and sensory than the latter. Thus, the traumatic events would be remembered better, more consistent over time, and could be characterized by a clear and accurate memory for central details of the event [12,13], although with little accuracy for irrelevant details, more also pointed to what happens with other autobiographical memories.

Against this proposal, some authors claim that these memories would be worse than memories for other autobiographical, because those can be recovered fragmented [14,15,16,17,18] and be difficult to express in narrative form, but can be associated with intense feelings (smelling, hearing, touch ...), and very visual [19,20,21]. Has even been proposed that these memories could be associated with episodes of amnesia, especially with extreme emotions, such as may elicit crimes of passion [22]. In any case, these episodes are usually associated with temporal amnesia of physical origin and intoxications by alcohol [23].

Proposals on fragmented memories of traumatic events are supported also in experimental and clinical studies on post traumatic stress disorder [24,25], which symptoms related to the memory illustrate this type of fragmented memory. Some of these symptoms include forgetting some details of the event, and remember vivid and persistent aspects as flashbacks.

#### *One type of memories not so different*

A few authors [26] state that although there were differences in some aspects between traumatic and neutral autobiographical memories, these do not imply substantial differences in their features or deterioration. Several recent studies [27,28,29] seem to confirm these claims with different populations. In the first study, memories of traumatic events (deaths, assaults, separations, accidents, terrorist attacks

and other) were compared with memories of happy events (births, entertainment, weddings, work, reunions, etc.), using the *Questionnaire on Phenomenological Characteristics of Autobiographical Memories*, designed for this purpose. This study was conducted with Spanish population and were considered 120 memories. In general, results showed that memories of traumatic events compared with the memories of happy events were characterized as containing less sensory information, be more complex, more difficult to date, more intense feelings associated, with a better memory of thoughts associated in the time of its occurrence, more difficult to express verbally and with more recurrent thoughts about what happened. By contrast, no significant differences on spatial location of the event, vividness, definition, accessibility, fragmentation, vantage point, doubts about its occurrence, or tendency to talk about what happened. Thus, reports on traumatic events did not seem so different from reports on other autobiographical.

Why such different conclusions? One of the reasons for this disparity is that the issue under study varies from one study to another, ie if the trauma is defined by its psychological effects on victims, then the proposals of different memories are proposed. But if the focus of the definition of trauma rests on the intrinsic characteristics of the agents that cause these, then the proposals on similar memories arise. The truth is that from the beginning the trauma is defined not so much the fact itself as physical or psychological effects it has had on the victims. The trauma goes beyond the individual's ability to tolerate and process that generates emotions and disrupts a person's strategies to manage in their lives. An attack, a car accident or a tsunami can be traumatic or not, depending on the psychological effects it has unleashed. It can also be accepted that the three events are traumatic for the fact of being a threat to personal integrity. Regardless of where the focus is located, when analyzing the literature, the first thing we consider

is what conception of trauma accompanying them, because only then disparities in the study of traumatic memories can be understood.

In any case, such as different views about the characteristics of traumatic memories, have raised the need for caution when generalizing conclusions on how to remember a traumatic event. It seems reasonable to conclude, in light of research that the same traumatic event can be remembered in a vivid and consistent, or conversely, it may be remembered fragmented, or not even be remembered. A better understanding of the influence factors could perhaps explain the differences between traumatic memories and autobiographical memories for neutral events.

#### **Factors which affect the characteristics of the memories**

The first factor to highlight is stress. This is indicated by those studies that point to their influence on memory [30,31]. Their relationship is complex, as traumatic stressful experiences can produce feelings of intense, vivid and persistent memories, while it produced significant impairment in attention span and memory. The experience of stress is not a function of the characteristics of trauma if not how each organism perceives and responds to traumatic stimulus. As every organism perceives and responds to stress depends on several factors, including prominently the temperament and attachment [32]. Derived from the combination of both factors will have a capacity type or another to deploy coping strategies necessary for the organism responds to traumatic stimulus without seriously disturbing the equilibrium, and thus minimizing its effect on memory or attention. In a case of aggression, in an environment where there is a sensitive reaction, regulating and protective, probably minimize the traumatic effects.

In any case, the intensity of the emotion associated with the event and the degree of involvement of the victim appear to be important. Generally, the autobiographical

events with significant emotional involvement are remembered more detail than routine events with low emotional involvement [33]. But this does not imply that all details are accurate remembered or memory generated is immune to the time delay. In a study conducted with Palestinian population of the Gaza Strip [34] the results showed to be the protagonist of the traumatic event leads to fragmented memories, more confusing ones, more intense feelings associated with, and reports more accessible, since they tend more re-experiencing and thinking about the events experienced, compared with the memories of individuals who witnessed the event and associated emotions which were less intense. In the same direction, the effect of involvement in the traumatic event on the accuracy of memories has been evaluated [35], found that the degree, type (central vs. peripheral) and accuracy of the details recorded by the subjects was directly related involvement of the subject.

### **Accuracy of traumatic memories**

It is very likely that some details of our autobiographical memories of traumatic events that we take for accurate have been "created" later [36,37]. Ost and colleagues [38] found in an experiment on memories of traumatic events, that 40% of subjects thought they saw fake scenes on the London bombings of 2005, which had been generated by researchers. In the same direction, there have been numerous studies on the memories about the terrorist attacks of 11-S in New York [39,40,41,42,43,44], showing interesting results essentially confirm the alteration of such reports over time. For example, Schmidt [45] found that the central facts are remembered with more consistency than the peripheral details, but the memories of this event contained many errors from improper reconstruction of events. More emotionally affected subjects showed a poorer memory and inconsistencies in the peripheral details that subjects less

affected. Any information that comes from estimates made by the subjects and not from their direct perception will be most likely to change over time.

However, it is common to hear the victims of violent events that, for example, "The facts have impressed me so much, and I'll never forget it" . This is because most people think that the more violent is an event more impact, and therefore better will be after his memory. The reality is that it has proven how events that involve a greater degree of violence are remembered worse [46]. Clifford and Scott explained this effect indicating that the subject experiences more stress involves much more violent event, and stress adversely affects cognitive processes such as attention, perception and memory. Stress reduces the attentional resources available, which makes it difficult to process information in depth. Thus, subjects can process the most basic information in a pre-attentional way, but not properly integrate all this information after a full and accurate representation, resulting in illusory conjunctions. The subject may have all the pieces of the puzzle, but ride the wrong way, leading to an account of the facts different from what actually happened [47].

### **Accessibility of traumatic memories**

It is sometimes said that the reports on traumatic events could be "repressed" or give rise to *dissociative* phenomena that create an inability to remember the events [48]. This type of psychogenic amnesia have been linked to post-traumatic stress disorder. Under these assumptions, the memory does not lose, but this would remain in the memory so inaccessible. Thus, much later, a similar event or the appropriate retrieval cues could make that memory back aware. These repressed memories before and now accessible have been called *recovered memories*. However, there has been no to verify the existence of such phenomena, as they are supposed more myth than reality.

Against these proposals, some authors [49,50,51] state that traumatic memories are recalled more and better than neutral memories. In a study of memories about sexual abuse, Porter and Birt [52] find that these memories tend to be remembered more often than other autobiographical memories, and in the few cases where they find that such events have been forgotten (4.6% of total) was due more to a deliberate attempt not to remember than a repressed or dissociated memory. The key to explain this controversy could probably be that the existence of psychogenic amnesia is based primarily on the statements of victims and in clinical samples, without a study of the verisimilitude of such events and which sometimes confuses the inability or difficulty to talk about the event with forgetting. Similarly, we should not confuse the phenomenological experience that generates the memory with the memory itself. In any case, it seems that the memory of traumatic events is immune to deterioration and distortion due to the suggestion of false information [53].

Regardless of the controversy about the existence of recovered memories should be noted that a thing is not wanting to remember and quite another to forget really. While many victims of a traumatic event try not to remember, the truth is that the accessibility of these memories does not seem to be compromised, but these people find it difficult to talk about what happened. This may explain why an event happened in childhood, long inaccessible, can be recovered spontaneously, when new retrieval cues. In any case, what is now recovered will be biased by new knowledge and experiences, leading to an interpretation of fact different from the original.

## **Conclusions**

In short, the debate on traumatic memories leads us to affirm that not all people remember traumatic events in the same way. Given a single traumatic event a percentage of the people involved have a memory of what happened in a very vivid throughout the years, another percentage will remember in a fragmented way, another one will have no differences in the way they remember about other events autobiographical, and, finally, some one may have problems in accessing some details of what happened.

Similarly, differences can be found at the time to remember. There are also differences in the psychological, emotional and psychiatric disorders that can lead to traumatic experience. Thus, there will be victims of traumatic events that have an enormous capacity for resilience and get over the trauma without much effort, but there will be people who come to suffer PTSD that can take years or even a severe personality disorder. Research and clinical practice has shown that there are factors that will determine the psychological impact of trauma may lead the victim of a traumatic event.

Surprisingly, unlike the clinical setting and experimental investigating individual differences in the impact of trauma, which nobody denies, and the factors that determine this impact, the study of traumatic memories not advocate more for studying the factors that mediate intersubjective and intrasubjective memories of a traumatic experience. Thus, more research will still be necessary to establish more specifically the differences between the memories of traumatic events and other events, and assess factors that might condition them (severity of the event, time elapsed, duration of the event, involvement, etc.).

Finally, though no less important, when we move in forensic contexts, should be considered the work on the accuracy of traumatic memories, they warn that there is no

type of memory that is not susceptible to distortion, regardless of type of trace that is generated. Memory stores interpretations of reality, not reality itself, and try to recover information from a fact of childhood in an adult context, means reinterpreting the information then stored. Not remember it does not mean it did not happen, but remember it does not imply that happen.

### **Acknowledgements**

This work is part of the research project "Interview, intervention and criteria of credibility in sexual abuse in people with intellectual disabilities," which takes place in the Carmen Pardo-Valcarce Foundation, in collaboration with the Fundación MAPFRE, and the University Complutense of Madrid.

## References

---

- 1 Brewin CR. Autobiographical memory for trauma: Update on four controversies. *Memory* 2007; 15: 227-48.
- 2 Nemeroff CB, Bremner JD, Foa EB, Mayberg HS, North CS Stein MB. Posttraumatic stress disorder: A state-of-science review. *J Psychiatric Research* 2006; 40: 1-21.
- 3 Silver RC, Holman EA, McIntosh. Nationwide longitudinal study for psychological responses to September 11. *JAMA* 2002; 288: 1235-44.
- 4 Manzanero AL. Recuerdo de hechos traumáticos: de la introspección al estudio objetivo. *Rev Psicopat Clin, Leg Forense* 2010; 10: 1-22,.
- 5 Brown R, Kulik J. Flashbulb memories. *Cognition* 1977; 5: 73-99.
- 6 Neisser U, Harsch N. Phantom flashbulbs: false recollections of hearing the news about Challenger. In Winograd E, Neisser U, eds. *Affect and accuracy: Studies of 'flashbulb' memories*. New York: Cambridge University Press; 1992. p. 9–31.
- 7 Peace KA, Porter S. A longitudinal investigation of the reliability of memories for trauma and other emotional experiences. *App Cog Psy* 2004; 18: 1143-59.
- 8 Peace KA, Porter S, Brinke L. Are memories for sexually traumatic events “special”? A within-subjects investigation of trauma and memory in a clinical sample. *Memory* 2008; 16: 10-21.
- 9 Pillemer DB. Flashbulb memories of the assassination attempt on President Reagan. *Cognition* 1984; 16: 63-80.
- 10 Peace KA, Porter S. A longitudinal investigation of the reliability of memories for trauma and other emotional experiences. *App Cog Psy* 2004; 18: 1143-59.
- 11 Peace KA, Porter S, Brinke L. Are memories for sexually traumatic events “special”? A within-subjects investigation of trauma and memory in a clinical sample. *Memory* 2008; 16: 10-21.

12 Christianson SA. Emotional stress and eyewitness memory: A critical review. *Psy Bull* 1992; 112: 284-309.

---

13 Loftus EF, Loftus GR, Messo J. Some facts about weapon focus. *Law Hum Beh* 1987; 11: 55-62. Manzanero, A.L. & Recio, M. (2012). El recuerdo de hechos traumáticos: exactitud, tipos y características. *Cuadernos de Medicina Forense*, 18(1), 19-25. doi:10.4321/S1135-76062012000100003

---

14 Byrne CA, Hyman IE, Scott KL. Comparisons of memories for traumatic events and other experiences. *App Cog Psychology* 2001; 15: 119–133.

15 Kihlstrom JF. The trauma-memory argument and recovered memory therapy. In Pezdek K, Banks WP, eds. *The recovered memory/false memory debate*. San Diego, CA: Academic Press; 1996. p. 297–311.

16 Neisser U, Harsch N. Phantom flashbulbs: false recollections of hearing the news about Challenger. In Winograd E, Neisser U, eds. *Affect and accuracy: Studies of ‘flashbulb’ memories*. New York: Cambridge University Press; 1992. p. 9–31.

17 Southwick SM, Morgan CA, Nicolaou AL, Charney DS. Consistency of memory for combat-related traumatic events in veterans of Operation Desert Storm. *Am J Psychiatry* 1997; 154: 173–177.

18 Yuille JC, Cutshall JL. A case study of eyewitness memory of a crime. *J App Psy* 1986; 71: 291-301.

19 Van der Kolk BA. Trauma and memory. In Van der Kolk BA, McFarlane NC, Wesaeth L, eds. *Traumatic Stress*. Nueva York: Guilford; 1996. p. 279-302.

20 Van der Kolk BA. The psychobiology of posttraumatic stress disorder. *J Clin Psych* 1997; 58: 16-24.

21 Herman JL. *Trauma and recovery*. New York: Basic Books; 1992.

22 Yuille JC, Cutshall JL. A case study of eyewitness memory of a crime. *J App Psy* 1986; 71: 291-301.

23 Baddeley A. Memoria autobiográfica. In A Baddeley, MW Eysenck y MC Anderson. *Memoria*. Madrid: Alianza Editorial; 2010. p. 165-191.

- 24 Nemeroff C, Bremner J, Foa E, Mayberg H, North C, Stein, M. Posttraumatic stress disorder: a state-of-science review. *J Psychiatric Research*, 2006; 40: 1-21
- 25 Cottecin O, Vaiva G, Huron C, Devos P, Ducrocq F, Jouvent R, Goudemand M, Thomas P. Directed forgetting in PTSD: a comparative study versus normal controls. *Journal of Psiquiatric Research* 2006; 40: 70-80.
- 26 Loftus EF. The reality of repressed memories. *Ame Psy* 1993; 48: 518-37
- 27 Manzanero AL, López B. Características de los recuerdos autobiográficos sobre sucesos traumáticos. *Bol Psicología* 2007; 90: 7-17.
- 28 López B, Manzanero AL, El-Astal S, Aróztegui J. Phenomenological features of autobiographical memories for negative events. Submitted.
- 29 Manzanero AL, Contreras MJ, López B, El-Astal S. Implication degree and emotion in autobiographical memories for negative events. Submitted.
- 30 Kim J, Diamond D. The stress hippocampus, synaptic plasticity and lost memories. *Nourosience* 2002; 3: 453-462
- 31 McEwen, B.S. Effects of adverse experiences for brain structure and function. *Biol Psychiatry*, 2000; 48: 721-31.
- 32 Nemeroff C, Bremner J, Foa E, Mayberg H, North C, Stein, M. Posttraumatic stress disorder: a state of science review. *Journal os Psiquiatric Research*, 2006, 40: 1-21
- 33 Talarico JM, LaBar KS, Rubin DC. Emotional intensity predicts autobiographical memory experience. *Mem Cog* 2004; 32: 1118-32.
- 34 Manzanero AL, Contreras MJ, López B, El-Astal S. Implication degree and emotion in autobiographical memories for negative events. Submitted.
- 35 Nachson I, Slavutskay-Tsukerman I. Effect of personal involvement in traumatic events on memory: The case of the Dolphinarium explosion. *Memory* 2010; 18: 241-251.
- 36 Brown R, Kulik J. Flashbulb memories. *Cognition* 1977; 5: 73-99.

37 Pillemer DB. Flashbulb memories of the assassination attempt on President Reagan. *Cognition* 1984; 16: 63-80.

38 Ost J, Granhag PA, Udell J, Hjelmsäter ER. Familiarity breeds distortion: The effects of media exposure on false reports concerning media coverage of the terrorist attacks in London on 7 July 2005. *Memory* 2007; 16: 76-85.

39 Lee PJ, Brown NR. Delay related changes in personal memories for September 11, 2001. *App Cog Psy* 2003; 17: 1007-15.

40 Luminet O, Curci A, Marsh EJ, Wessel I, Constantin C, Gencoz F, Yoko M. The cognitive, emotional, and social impacts of the September 11 attacks: Group differences in memory for the reception context and the determinants of flashbulb memory. *J Gral Psy* 2004; 13: 197-224.

41 Pezdek K. Event memory and autobiographical memory for events of September 11, 2001. *App Cog Psy* 2003; 17: 1033-45.

42 Schmidt SR. Autobiographical memories for the September 11th attacks: Reconstructive errors and emotional impairment of memory. *Mem Cog* 2004; 32: 443-54.

43 Talarico JM, Rubin DC. Flashbulb memories are special after all; in phenomenology, not accuracy. *App Cog Psy* 2007; 21: 557-78.

44 Tekcam AI, Ece B, Gülgöz S, Er N. Autobiographical and event memory for 9/11: Changes across one year. *App Cog Psy* 2003; 17: 1057-66.

45 Schmidt SR. Autobiographical memories for the September 11th attacks: Reconstructive errors and emotional impairment of memory. *Mem Cog* 2004; 32: 443-54.

46 Clifford BR, Scott J. Individual and situational factors in eyewitness testimony. *J App Psy* 1978; 63: 352-59.

47 Manzanero AL. Memoria de testigos: Obtención y valoración de la prueba testifical. Madrid: Pirámide, 2010.

48 Van der Kolk BA, Fislser R. Dissociation and the fragmentary nature of traumatic memories: Overview and exploratory study. *J Traumatic Stress* 1995; 8: 505-25.

49 Terr LC. Chowchilla revisited: The effects of psychic trauma four years after a school-bus kidnapping. *American J Psy* 1983; 140: 1543-50.

50 Wagenaar WA, Groeneweg J. The memory of concentration camp survivors. *App Cog Psy* 1990; 4: 77-87.

51 Yuille JC, Cutshall JL. A case study of eyewitness memory of a crime. *J App Psy* 1986; 71: 291-301.

52 Porter S, Birt AR. Is traumatic memory special? A comparison of traumatic memory characteristics with memory for other emotional life experiences. *App Cog Psy* 2001; 15: 101-17.

53 Paz-Alonso PM, Goodman GS. Trauma and memory: Effects of post-event misinformation, retrieval order, and retention interval. *Memory* 2007; 16: 58-75.